

REMARKS/ARGUMENTS

The Office Action mailed July 11, 2006 has been carefully considered.
Reconsideration in view of the following remarks is respectfully requested.

Record of Interview

On June 29 and July 5, 2006, a interview was conducted by telephone between Examiner Christine Sung and Masako Ando (Limited Recognition No. L 0016). Applicants thank the Examiner for granting the interview. The details of the interview are set forth in the separate Interview Summary documents made of record.

Please note that the proposed amendment (informal) submitted on July 5, 2006 via facsimile was not entered or made of records, and thus the claim amendment in this response is based on the previous claims listed in the Applicant's response of April 14, 2006.

Claim Status and Amendment to the Claims

Claims 1-10 and 12-20 are now pending. No claims stand allowed.

Claim 11 has been canceled by this amendment, without prejudice or disclaimer of the subject matter contained therein.

Claims 1-2, 9-10, and 12-16 have been amended to further particularly point out and distinctly claim subject matter regarded as the invention. Support for these changes may be found in the specification, page 5, lines 27-28, page 10, lines 26-27, and page 12, line 17 through page 13, line 24. The amendment also contains minor changes of a clerical nature.

New claims 17-20 have been added, which also particularly point out and distinctly claim subject matter regarded as the invention. Support for these changes may be found in the specification, page 5, lines 27-28, page 10, lines 26-27, and page 12, line 17 through page 13, line 24.

No "new matter" has been added by the amendment.

The 35 U.S.C. §103 Rejection

Claims 1-4, 7-9, and 11-16 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Jeromin (U.S. Pat. No. 5,381,014) in view of Gale (U.S. Pat. No. 4,585,513), among which claims 1, 2, 14, and 16 are independent claims. In addition, dependent claims 5-6 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Jeromin in view of Gale, and further in view of the admitted prior art. Claim 10 also stands rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Jeromin in view of Gale, and further in view of Mori et al. (U.S. Pat. No. 4,591,984). The rejections are respectfully traversed.

According to M.P.E.P. §2143,

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

Furthermore, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Claim 1 defines an X-radiation imagery device comprising at least one detection matrix. The claimed detection matrix comprises (a) an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charges reading panel including a monocrystalline silicon substrate integrating a plurality of electronic devices, and (b) a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, the detection layer converting incident X photons into electric charges, each electronic device and a portion

of the detection layer formed thereon forming a respective pixel of the detection matrix, as recited in claim 1, as amended.

In the Office Action, the Examiner maintains the previous rejections and alleges that the elements of the presently claimed invention are disclosed in Jeromin except that Jeromin does not teach that the electric charges reading panel is made of monocrystalline silicon. The Examiner further alleges that Gale discloses a conventional single crystalline silicon substrate or electric charges reading panel. In addition, the Examiner specifically contends, in the Response to Arguments section, as follows:

7. ... applicant does not state in the claim that the image is a large device to, and further, applicant claims that there are multiple detection matrices that combine to form a large area detector. Such a detector set up has several smaller substrates tiled together, not a single large substrate. Therefore applicant's argument that the detector substrate disclosed by Gale and Jeromin are not suited for large area detectors [is] not persuasive.

8. ... The claims also fails to disclose a specific positioning of the circuitry elements. As the claims now stand, the processing circuitry is only required to be integrate by pixel, meaning that they are a part of a pixel element. Such configurations are known and disclosed by reference such as Stettner as well as Jeromin.

Applicant respectfully disagrees for the reason set forth below.

Claim 1 (as well as other independent claims) has been amended so as to clearly recite the large size of the claimed imaging device. In addition, the structure and function of the pixels and the detection layer has been further clarified, reciting that each electronic device and a portion of the detection layer formed thereon forms a respective pixel of the detection matrix. In addition, Furthermore, when more than one detection matrices are assembled to form a large area digital detector in one embodiment of the present invention (claim 13), each detection matrix is that which is recited in claim 2, whose electric charges reading panel has an area equal to or larger than about 10 cm x 10 cm. Thus, the alleged "smaller" panels to be combined is still a large area detector.

With these amendment and clarification, please reconsider the following arguments.

In the Office Action, the Examiner essentially alleges that it would have been obvious to combine Gale's single crystalline silicon substrate **24** so as to replace Jeromin's dielectric (glass) substrate **15** having pixels **19** (i.e., the alleged "electric charges reading panel including a plurality of electronic devices") with Gale's single crystalline silicon substrate **24** to obtain the claimed invention.

Jeromin describes a large area X-ray imager having a dielectric (glass) substrate **15**, on which transistor-capacitor pixels **19** and a radiation detecting layer **14** are formed (see Abstract, FIG. 1 thereof).

Gale allegedly discloses a CCD imager **22** including a thin single crystalline silicon substrate **24** having a CCD imager formed along one surface **26** thereof, and a support **28** made of a transparent material, such as glass, on the other surface **30** (column 2, lines 32-36, FIG. 1 thereof). The silicon substrate **24** is adhered to a backing plate **34** by an adhesive layer **35** (column 2, lines 30-60, Fig. 6 of Gale). Gale also describes the method for removing the portion of the glass support **28** exposed through the housing window **18** to form an opening (see FIGS. 1-3 and 6, column 1, lines 5-8, and column 2, lines 54-65). Furthermore, Gale teaches an etching process for the glass removal using a specific apparatus **40** which moves/rotates the CCD imager assembly **10** placed in a container **42** containing etchant (see FIG. 5, column 3, line 60 through column 4, line 25 thereof).

However, such an etching process is only feasible for a small CCD imagers, and thus is not suitable to realize large digital imagers such as X-radiation imagery devices. Thus, Gale dissuade one of ordinary skill in the art from applying teaching of Gale to a large area X-ray imager of Jeromin. The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). "The test for an implicit showing is what the combined teachings, knowledge

of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Gale lacks any of such suggestions or desirability to combine a small-sized, thin semiconductor substrate **24** with Jeromin's large area X-ray imager replace Jeromin's glass substrate.

In addition, the Examiner's allegation that "single crystalline silicon has greater detection efficiency than selenium as disclosed by Jeromin' to replace Jeromin's glass substrate **15** with Gale's monocrystalline silicon substrate **24**" does not provide the alleged motivation to combine Gale with Jeromin, because Jeromin uses selenium for the radiation detecting layer **14**, not for the glass substrate **15** (the alleged electric charges reading panel). Thus, according to the alleged motivation, one of ordinary skill in the art would replace Jeromin's radiation detecting layer **14** with Gale's silicon substrate **24**, which results in an imager having a glass substrate **15** as the alleged electric charged reading panel with a detecting layer made of monocrystalline semiconductor substrate. Thus, the Examiner fails to allege required motivation to maintain the §103 rejection.

Accordingly, none of the references provides the motivation or desirability of the alleged combination, and even if Jeromin and Gale should be combined in accordance with the Examiner's allegation, such a combination would not yield the claimed invention.

Claims 2, 14, and 16 also include substantially the same distinctive feature as claim 1. Accordingly, it is respectfully requested that the rejection of claims based on Jeromin an Gale withdrawn. In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Dependent Claims

Claims 8-10 and 17 depend from claim 1, claims 3-7, 12-13, and 18 depend from claim 2, claims 15 and 19 depend from claim 14, and claim 20 depends from claim 16, and thus include the limitations of respective independent claims. The argument set forth

above is equally applicable here. The base claims being allowable, the dependent claims must also be allowable at least for the same reasons.

In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-1698.

Respectfully submitted,
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